

CODE APPLICATION NOTICE

FILE NO. 2-2211A.7.1.2

DATE: July 16, 1997

CODE SECTION: Section 2211A.7.1.2, Title 24, Part 2 California Code of Regulations

ConnectionStrength. *Connection configurations utilizing welds or high-strength bolts shall demonstrate, by approved cyclic test results or calculations, the ability to sustain inelastic rotation and develop the strength criteria in Section 2211A.7.1.1 considering the effects of steel overstrength and strain hardening.*

INTERPRETATION:

The Office will utilize the **Interim Guidelines: Evaluation, Repair, Modification and Design of Welded Steel Moment Frame Structures** (FEMA 267, August 1995) and the **Interim Guidelines Advisory No. 1** (FEMA 267A, March 1997) for the evaluation of proposed designs using WSMRF systems. These guidelines are considered to be the “state of the practice” with regard to WSMRF design and construction. In addition to the referenced guideline, the Office requires that:

1. The design team contact the Office to review building configuration and frame layout.
2. The design team and the Office review and approve the proposed design criteria defining the design methodology to be used for the WSMRF system. The criteria should reference appropriate sections of FEMA 267 or FEMA 267A. The review and approval of the design methodology should occur well in advance of the submittal of contract documents for review.
3. Where testing is required, the consultant shall submit testing criteria, procedures and all welding procedure specifications (WPS's) for review and approval prior to testing. The Office shall be notified prior to testing so that if possible, a representative of the Office can be present.
4. Other testing and inspections required by Title 24, Part 2 are also applicable. This includes the review and approval of the WPS's for the critical welds.
5. The design team consider and implement the provisions of Chapter 9, Quality Control/Quality Assurance of FEMA 267 and FEMA 267A.

Proposed joint configurations similar to member sizes, joint configurations, and material

specifications previously tested may not require retesting for each project.

While the revised language of the 1994 UBC/Title 24, Part 2 may not directly apply to Ordinary Moment Resisting Frames (OMRF), and Eccentric Braced Frames (EBF's), the designer should consider the Commentary to Sections 7.1, 7.2.1 and 7.10.1 in its entirety, of the reference, prior to proceeding with a design utilizing these systems.

The use of welding electrodes with no specified notch toughness (CVN) for the beam column connection in the moment resisting frame is not allowed. There is general agreement that electrodes without CVN values should not be used in critical joints (Sections 7.6 and 8.2.3). OSHPD considers all of the welds within the connection to be critical to minimize the possibility of crack formation at other sections. The Commentary to Section 7.6 states in part; "... Some professionals knowledgeable in fracture mechanics believe it is essential that all weld metal in the beam column connection, including both field and shop welds, welds of continuity plates, etc., as well as welds of beam to column flanges, should have minimum specified notch toughness...." Welding electrodes should have a specified notch toughness of 20 ft-lbs @ -20EF per Table 1, ANSI/AWS A5.20-95 or later editions. It would be highly unlikely that OSHPD would approve joint configurations utilizing non-notch tough wire.

As new information becomes available, the owners and the design team of projects not yet approved, will be notified of this new information to see if it can be incorporated into the project.

REASON:

The current code is written in performance oriented language without prescriptive language, as was done prior to the emergency code change of October 25, 1994, to guide the designer. By referencing FEMA 267 and 267A, the Office is using the "state of the practice" document to provide interpretation and guidance to the design team for design, and for the Office to plan check a project.

ORIGINAL SIGNED

7/17/97

Kurt A. Schaefer

Date

Attachments

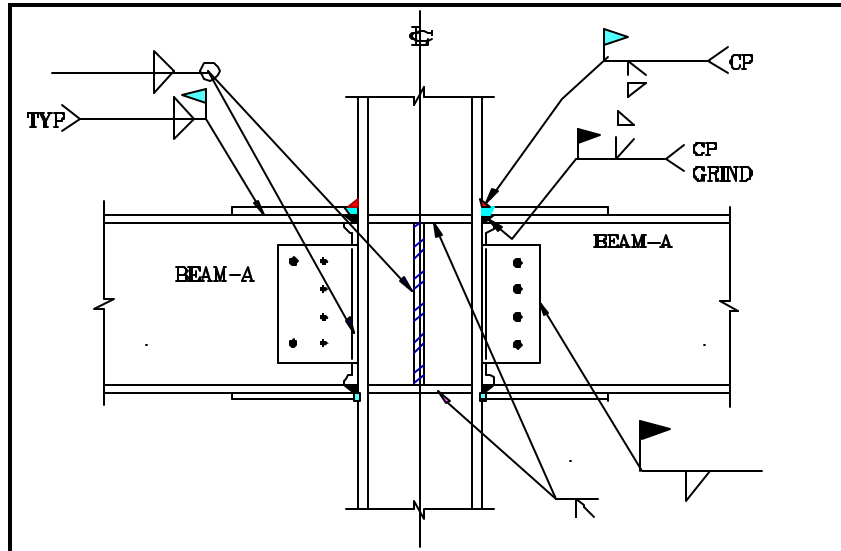


Figure 1

DISCLAIMER: The OSHPD does not endorse the use of any single configuration in the design of steel moment frame joints. The configuration shown is to provide the user with a visual representation of those types of welds that very probably should utilize a specified notch tough electrode in their fabrication. Other configurations will

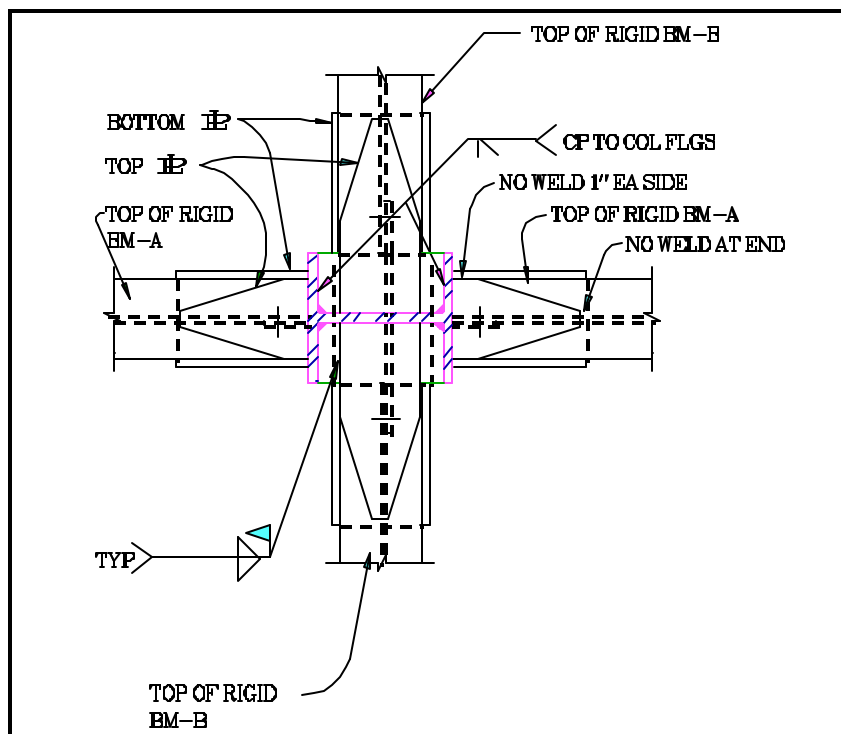


Figure 2

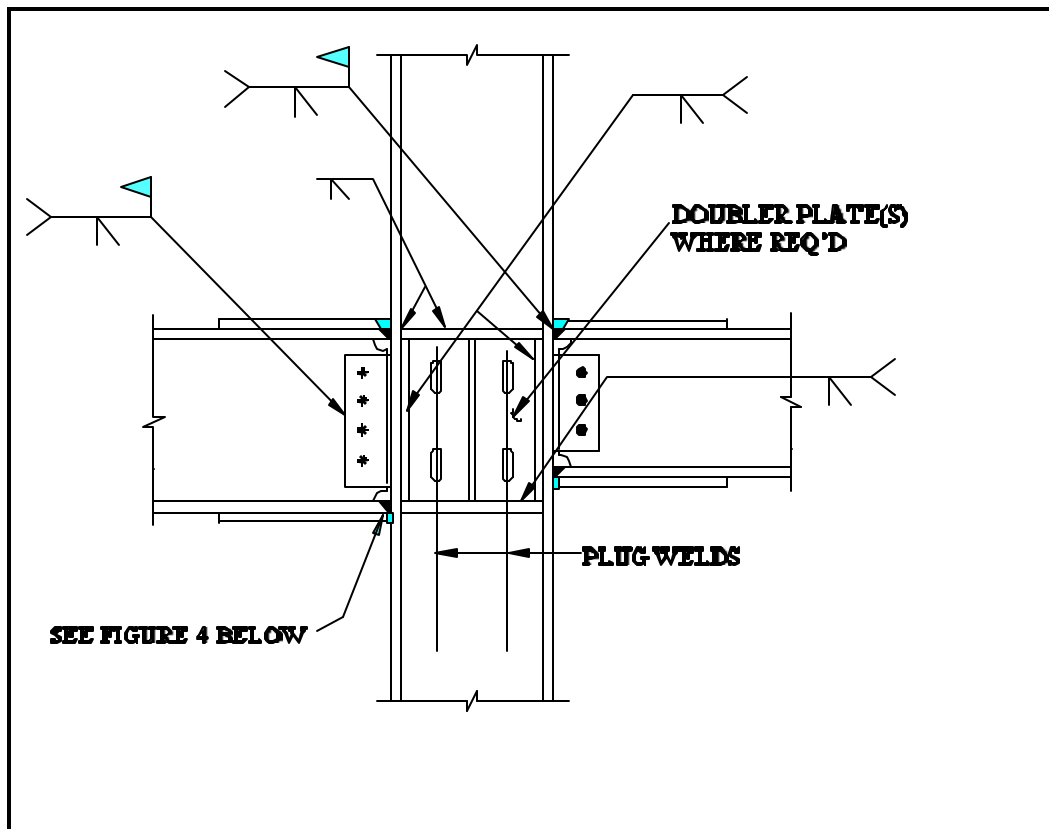


Figure 3

DISCLAIMER: The OSHPD does not endorse the use of any single configuration in the design of steel moment resisting frame joints. The configuration shown is to provide the user with a visual representation of those types of welds that should very probably utilize a specified notch tough electrode in their fabrication. Other configurations will very probably have identical weld requirements.

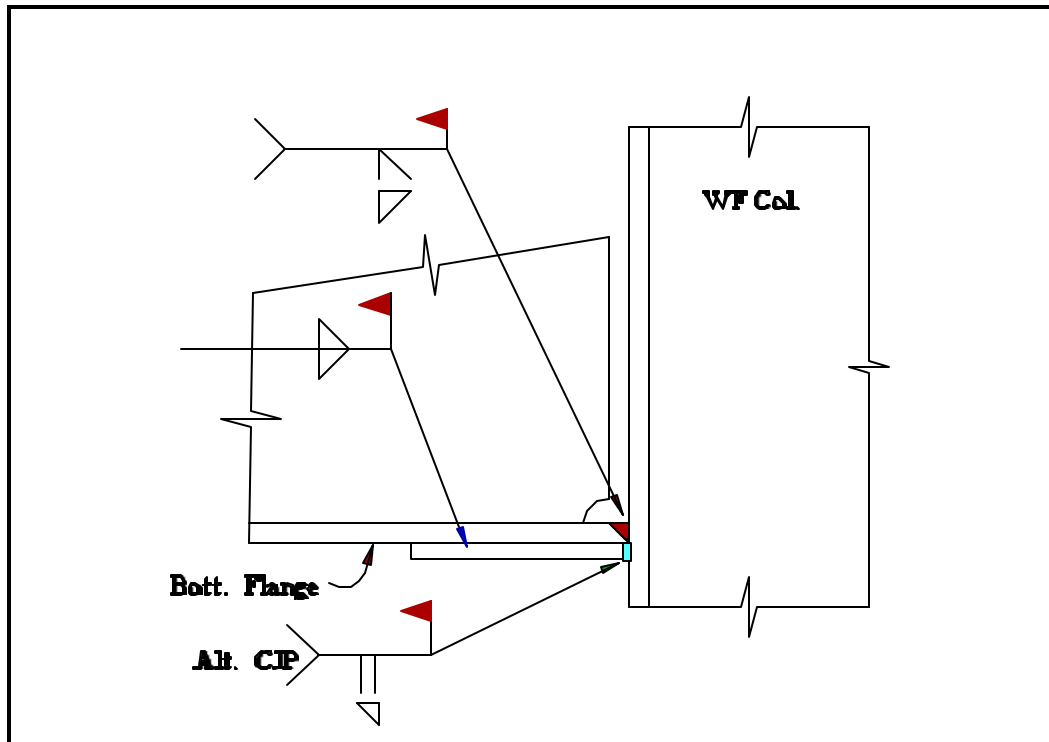


Figure 4

DISCLAIMER: The OSHPD does not endorse the use of any single configuration in the design of steel moment resisting frame joints. The configuration shown is to provide the user with a visual representation of those types of welds that should very probably utilize a specified notch tough electrode in their fabrication. Other configurations will very probably have identical weld requirements.